Progress Energy

Serial: RNP-RA/05-0028

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United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23

RESPONSE TO NRC SUPPLEMENTAL REQUEST FOR ADDITIONAL INFORMATION REGARDING NRC BULLETIN 2003-01, "POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY SUMP RECIRCULATION AT PRESSURIZED-WATER REACTORS"

Ladies and Gentlemen:

On June 9, 2003, NRC Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors," was issued requesting that licensees provide a response within 60 days. Progress Energy Carolinas, Inc. (PEC), also known as Carolina Power and Light Company, responded to NRC Bulletin 2003-01 in a letter dated August 8, 2003, for H. B. Robinson Steam Electric Plant, Unit No. 2. A response to a subsequent Request for Additional Information was provided by a letter dated October 26, 2004. A response to a supplemental Request for Additional Information, which was received by facsimile transmission on March 8, 2005, is provided in Attachment II to this letter.

Attachment I provides an Affirmation in accordance with the provisions of Section 182a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f).

If you have any questions concerning this matter, please contact Mr. C. T. Baucom at (843) 857-1253.

Sincerely,

Rosemary J. Westbrook for Jan Lucas

Jan F. Lucas
Manager – Support Services – Nuclear

A103

Progress Energy Carolinas, Inc.
Robinson Nuclear Plant
3581 West Entrance Road
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CTB/cac

Attachments:

I. Affirmation

II. Response to NRC Supplemental Request for Additional Information Regarding NRC Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors"

c: Dr. W. D. Travers, NRC, Region II
Mr. C. P. Patel, NRC, NRR
NRC Resident Inspector

AFFIRMATION

The information contained in letter RNP-RA/05-0028 is true and correct to the best of my information, knowledge and belief; and the sources of my information are officers, employees, contractors, and agents of Progress Energy Carolinas, Inc., also known as Carolina Power and Light Company. I declare under penalty of perjury that the foregoing is true and correct.

Executed On: 1 Apr. 2005

J. W. Moyer
Vice President, HBRSEP, Unit No. 2

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NRC Supplemental Question 1

In your Response to NRC Request for Additional Information regarding NRC Bulletin 2003-01 dated October 26, 2004, Attachment II to Serial RNP-RA/04-0121 Response 1 to NRC Question 1, you list six steps to take in the event of sump blockage and loss of ECCS recirculation capability. Step 4 of this list states as follows: "New steps were added to EPP-9 and EPP-10 to raise containment pressure by 2 psig, if sump blockage is still indicated and containment conditions permit. A new Supplement was added to the EPP-Supplements providing detailed instructions on how to raise containment pressure using the Station or Instrument Air Systems. This should improve NPSH for the recirculation pumps." Please provide information indicating where pressurizing containment with air is allowable in the Robinson Nuclear Plant accident analysis. Also provide a technical rationale for how this action does not "increase the consequences of an accident" and is allowable under the guidance of 10 CFR 50.59.

Response to Question 1

The loss of containment sump recirculation capability is beyond the design basis for H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2. Therefore, some of the actions and mitigation strategies employed to mitigate this phenomenon are also beyond the design basis. Procedures EPP-9, "Transfer to Cold Leg Recirculation," and EPP-10, "Transfer to Long Term Recirculation," contain a caution statement prior to entry into the sections of the procedures that use the strategies that are beyond the design and licensing basis for HBRSEP, Unit No. 2. That caution states, "The Operator should be sure that cavitation is taking place prior to transitioning to steps that attempt to mitigate screen blockage. The actions taken are beyond design basis AND should NOT be taken unless warranted."

The use of station or instrument air to pressurize the containment by about 2 psig, for the purpose of increasing net positive suction head (NPSH) for the low pressure safety injection pumps (also referred to as residual heat removal [RHR]), is invoked in the emergency operating procedures after initial attempts to recover NPSH have been determined to be unsuccessful. In this situation, these "beyond design basis" actions to maintain or recover containment sump recirculation capability are being taken to mitigate the loss of NPSH condition that is also considered "beyond design basis" for HBRSEP, Unit No. 2. Therefore, there is no information that can be provided that indicates pressurizing containment with air is allowable in the HBRSEP, Unit No. 2, accident analyses.

The methods used for pressurizing the containment for recovery of containment sump recirculation NPSH are similar to the methods described in the HBRSEP, Unit No. 2, Updated Final Safety Analysis Report (UFSAR), Section 6.2.5.2.1, "Post-Accident Venting System." Therefore, the use of this method for attempting to recover NPSH utilizes existing systems, structures, and components in a manner consistent with their intended purposes.

The changes to the emergency operating procedures (EOPs) that incorporated the procedure steps for increasing containment pressure to recover containment sump recirculation NPSH were evaluated in accordance with the procedure change process requirements. The 10 CFR 50.59 review (also referred to as a "screen") of these procedure changes was conducted in accordance with Nuclear Generation Group (NGG) procedure REG-NGGC-0010, "10 CFR 50.59 and Selected Regulatory Reviews." The documentation of this review states, "Actions taken prior to indication of sump screen blockage (RHR cavitation or distress) must be within design basis and meet the normal criteria for a 50.59 screen with respect to satisfying design criteria such as single failure assumptions used in the design calculations. Those actions taken after signs of sump screen blockage are considered beyond design basis and need not meet these criteria. The beyond design basis actions must meet the criteria used in other beyond design basis EOPs. These are that the actions are reasonable and prudent, based on 'best estimate,' and do not result in a safety significant deviation as defined in NUREG-1358."

The actions associated with increasing containment pressure to restore containment sump recirculation NPSH are considered to be in the latter category (i.e., beyond design basis category) of change, as stated. Therefore, the technical rationale for how this action does not increase the consequences of an accident is based on the judgment that the use of air systems to increase containment pressure to recover NPSH is expected to result in equal or less significant consequences than those associated with a loss of containment sump recirculation. Furthermore, the use of this action is limited to containment pressures less than 30 psig and allows only 2 psig of pressure increase. Based on this approach, the containment pressure would continue to remain substantially below the design pressure of 42 psig.

NRC Supplemental Question 2

In the same document, step 5 states: "New steps were added to EPP-9 and EPP-10 to operate the SI and RHR pumps in an intermittent mode until pump distress is alleviated. The operating SI and RHR pumps are stopped and then restarted in the opposite train if both trains are available. This is done in six minute intervals." To properly evaluate this statement, a technical justification for the six minute value is needed. Please provide the rationale or support documentation that indicates that a six minute interval for starting/stopping SI and RHR pumps is acceptable to meet core cooling requirements while maintaining reliability of the pumps to operate.

Response to Question 2

The HBRSEP, Unit No. 2, plant-specific basis documents for EPP-9 and EPP-10 provide the justification for the six-minute interval, as follows:

"This step is reached after the short term actions to mitigate the event have been performed. It is the last of the actions that can be completed in a short period of time and is also the most draconian action. The operating RHR pump and SI pump are stopped and restarted in the opposite train at 6 minute intervals until NPSH is restored to the RHR pump. Six minutes was chosen because there is an existing calculation that shows no fuel damage from a 6 minute interruption of flow to the core after the 73 minute hold point (LBLOCA). This is the longest delay supported by a calculation. The actual calculation cannot be credited for these 6 minute intervals under a design basis scenario because the calculation assumes at least 7 minutes of pump run time before stopping the pump. These intermittent start/stops will not have this time frame of flow. Six minutes was used because this event is beyond design basis and using best estimate assumptions, 6 minutes should provide adequate temporary relief. The intent is to balance the need for short term relief against the need to not damage the RHR and SI pumps with excessive starting and stopping. This step is bypassed if only one train of Safeguards components are available since the repetitive start and stop of the single RHR pump will likely cause damage and loss of the pump for any future actions. Even with two pumps the pump starting duty limits will be exceeded if the screen blockage cannot be cleared."

NRC Supplemental Question 3

It should also be noted that NRC Request for Additional Information question 3 asks, in part: "NRC Bulletin 2003-01 provides possible interim compensatory measures licensees could consider to reduce risks associated with sump clogging. In addition to those compensatory measures listed in Bulletin 2003-01, licensees may also consider implementing unique or plant-specific compensatory measures, as applicable. Please discuss any possible unique or plant-specific compensatory measures you considered for implementation at your plant." The Bulletin specifically refers to six possible categories of interim compensatory measures. Westinghouse Owners Group (WOG) Candidate Operator Actions (COAs), contained in WCAP-16204, were developed in response to the Bulletin 2003-01 request for consideration of sump clogging interim compensatory measures. Response 3 from Progress Energy makes specific reference to the six categories of interim compensatory measures in a bulleted format, then provides the following conclusion statement: "HBRSEP, Unit No. 2, did not consider for implementation any possible unique or plant-specific interim compensatory measures beyond those described above." The two actions identified above (pressurization of containment with an external air supply, and cycling SI & RHR pumps at six minute intervals) are not referenced in the six categories of compensatory measures outlined in Bulletin 2003-01, nor included in the WOG COAs, and therefore should have been specifically identified in this RAI response. Please confirm that there are no other proposed interim actions or compensatory measures that are unique or plant-specific to HBRSEP.

Response to Question 3

There are no other proposed interim actions or compensatory measures that are unique or plant-specific to HBRSEP, Unit No. 2. The information provided in Attachment II to the October 26, 2004, letter was intended to convey that there are no other proposed interim actions or

compensatory measures that are unique or plant-specific to HBRSEP, Unit No. 2. The general statement provided as "beyond those described above," was intended to refer to the compendium of information provided. The "plant-specific" compensatory measures associated with the pressurization of containment with plant air systems and the intermittent operation of ECCS pumps were originally described in the HBRSEP, Unit No. 2, response to Bulletin 2003-01, dated August 8, 2003. These compensatory measures were described under the information provided for "Compensatory Measure 1: Operator training on indications of and responses to sump clogging." These compensatory measures were further described in the October 26, 2004, response to Request for Additional Information, Question 1, which requested information pertaining to operator training and procedure revisions.

Additionally, discussions were held between NRC staff and HBRSEP, Unit No. 2, personnel pertaining to the referenced Request for Additional Information, Question 3. In those discussions, it was conveyed that the NRC staff was seeking "unique or plant-specific compensatory measures," including those that may have been discarded, that may be useful to the NRC or other licensees. It was the judgment of HBRSEP, Unit No. 2, personnel that there were no additional actions that met that criterion.